REMARKS

In response to the Office Action of August 1, 2005, the Applicant respectfully requests reconsideration. The amendments above, and remarks that follow, address points raised in the Office Action, and, thereby, place this application in condition for allowance.

Claims 1-29 are pending in this Application. Claims 1-6, 8-14, 17, 18, 20-26, 28, and 29 are rejected and claims 7, 15, 16, 19, and 27 are objected to. Claims 1, 11, and 22 are independent claims and the remaining claims are dependent claims.

No new matter has been added to the application as a result of the amendments and the Applicants have not raised any new issues that would require further searching and consideration.

Allowable Subject Matter

Claims 7, 15, 16, 19, and 27 were objected to as being dependent upon a rejected base claim, but were deemed allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Oath/Declaration

The Examiner has indicated that the oath or declaration is defective because it is missing from the file and has required submission of a new oath or declaration. A copy of the Response to Notice To File Missing Parts, submitted on June 17, 2002 which includes the previously transmitted Declaration and Power of Attorney form is enclosed with this Response.

Drawing Objections

The drawings have been objected to because reference numbers "112" and "100" in Figure 1 and reference numbers "314" and "312" in Figure 5 have been deemed improper. Figures 1 and 5 have been corrected in accordance with the Examiner's suggestions.

The drawings have also been objected to as failing to comply 37 C.F.R. 1.84(p)(5) because Figures 2, 3, 5, and 7 do not include various reference numbers described in the specification. The Examiner indicated the following reference numbers were not found in the Figures:

11

a.) Figure 2, reference 212

b.) Figure 2 (recited as Figure 5 in the Office Action), reference 214

c.) Figure 2 (recited as Figure 3), reference 216

d.) Figure 3, reference 118

e.) Figure 5, reference 502

f.) Figure 7, reference 710

The appropriate reference numbers have been added to Figures 5 and 7. The specification has been amended on page 18 to remove the recitation of references 212, 214, and 216 with respect to Figure 2 and on page 21, line 39 to remove the recitation of reference 118 with respect to Figure 3.

No new matter is added to the application by the revisions to the drawings and specification. Additionally, a Notice to the Official Draftsperson is enclosed with this Response.

Specification Objections:

The disclosure was objected to because of various informalities. As requested by the Examiner, a substitute specification, including the claims, showing all of the changes relative to the immediate prior version of the specification of record is provided with this amendment, pursuant to 37 C.F.R. 1.125(a). An accompanying clean version is also supplied. The substitute specification contains no new matter.

Claim Objections:

Claims 1-22 were objected to as being improper for various informalities. Claims 1-22 have been amended to correct the majority of the informalities raised by the Examiner. The objection to claim 19, however, requires further consideration. Claim 19 was objected to because t, n, r, and y k (n+1) are not defined. However, n is recited in the claim as being an iteration count, t and r are not recited in the claim, and y k (n+1) is indicated in the preamble as being a second user matched filter detection statistic, for example. As such, claim 19 has not been amended to define the listed terms. Reconsideration of the objection is respectfully requested.

<u>*Claim Rejections Under 35 U.S.C. §112:*</u>

Claim 29 is rejected under 35 U.S.C. §112, second paragraph, for failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention. The Examiner indicates that the use of Re, H, c*km [r] is vague and indefinite. The claim has been amended to clarify the use of elements H and c*km [r]. The term Re is shorthand notation to indicate that the **Re**al part of a complex number (e.g., having real and imaginary components) should be taken into consideration in a given instance and is a known mathematical term. As such, claim 29 has not been amended to recite the definition of Re The amendment to claim 29 does not add new matter to the application and reconsideration of the objection is respectfully requested.

<u>*Claim Rejections Under 35 U.S.C. §102(e):*</u>

Claims 1-3, 5, 6, 8, 10-13, 17, 18, and 20-26 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,570,864 to Kim et al. The Examiner, however, has not established that Kim anticipates independent claims 1, 11, and 22 of the present Application because Kim does not teach or suggest every element of the Applicant's claims. The Applicant respectfully traverses each of these rejections and requests reconsideration. The claims are in allowable condition.

The Applicant's independent claim 1 relates to a spread spectrum communication system of the type that processes one or more spread-spectrum waveforms ("user spread-spectrum waveforms"), each representative of a waveform associated with a respective user. The system includes a first logic element that generates a *residual composite spread-spectrum waveform as a function of an arithmetic difference between a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform.* The system also includes one or more second logic elements each coupled to the first logic element, each second logic element generating a refined matched-filter detection statistic for at least a selected user as a function of (i) the residual composite spread-spectrum waveform and (ii) a characteristic of an estimate of the selected user's spread-spectrum waveform.

The Applicant's independent claim 11 relates to a spread spectrum communication system of the type that processes one or more user spread-spectrum waveforms, each representative of a waveform associated with a respective user. The system includes a first logic element which generates an *estimated composite spread-spectrum waveform that is a function of estimated user complex channel amplitudes, time lags, and user codes.* The system also includes a second logic element coupled to the first logic element, the second logic element

13

generating *a residual composite spread-spectrum waveform as a function of an arithmetic difference between a composite user spread-spectrum waveform and the estimated composite spread-spectrum waveform.* Furthermore, the system includes one or more third logic elements each coupled to the second logic element, the third logic element generating a refined matched-filter detection statistic for at least a selected user as a function of (i) the residual composite spread-spectrum waveform and (ii) a characteristic of an estimate of the selected user's spread-spectrum waveform.

The Applicant's independent claim 22 relates to a method for multiple user detection in a spread-spectrum communication system that processes long-code spread-spectrum user transmitted waveforms. The method includes generating a residual composite spread-spectrum waveform as a function of an arithmetic difference between a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform. The method further includes generating a refined matched-filter detection statistic that is a function of a sum of a rake-processed residual composite spread-spectrum waveform for a selected user and an amplitude statistic for that selected user.

Kim relates to a multi-user receiving apparatus for canceling an interference signal in a code division multiple access (CDMA) system. In Kim, the apparatus includes a delay unit for delaying a receiving signal and an interference cancellation unit for canceling the interference of the signal, which is delayed and transmitted through the delay unit.

As indicated above, claims 1, 11, and 22 each generally recite generating *a residual composite spread-spectrum waveform as a function of ... a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform.* With respect to the rejection of this element of the claims, the Examiner recites block 240 of Kim as performing this function. Kim, however, recites the interference cancellation device 240 as including

> an adding element 241 and adding elements 261 to 26N. The adding element 241 *adds the interference signal regenerated by the interference regeneration devices 231 to 23N to the receiving signal transmitted through the delay unit 211.* Adding elements 261 to 26N add the interference signal regenerated by the interference regeneration devices 231 to 23N to the added value through the adding element 241. (Column 3, lines 12-19, emphasis added).

By contrast to the Applicant's independent claims, Kim does not teach or disclose either the interference signal regenerated by the interference regeneration devices or the receiving signal transmitted through the delay unit as being a *composite spread-spectrum waveform or an estimated composite spread-spectrum waveform,* as claimed by the Applicant. It is unclear

14

how the receiving signal in Kim can be considered to be <u>an estimate</u> of the interference signal or how the interference signal can be considered to be <u>an estimate</u> of the receiving signal. If the rejection of claims 1, 11, and 22 is to be maintained, the Applicant respectfully requests that it be pointed out with particularity where Kim teaches one signal as being an estimate of the other.

Furthermore, claims 1, 11, and 22 recite generating a residual composite spread-spectrum waveform as a function of an *arithmetic difference* between a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform. With respect to the rejection of independent claim 22, the Examiner recites block 240 of Kim as performing this function. However, Kim does not teach or disclose interference cancellation device 240 as taking an arithmetic *difference between* two signals. In Kim, as recited above, the adding element 241 <u>adds</u> the interference signal regenerated by the interference regeneration devices 231 to 23N to the receiving signal transmitted through the delay unit 211. Based upon Kim's disclosure, the output of the device is a <u>sum</u> of the interference signal and the receiving signal. As a result, Kim does not teach or disclose generating a residual composite spread-spectrum waveform as a function of an *arithmetic difference* between a composite spread-spectrum waveform and an estimated composite spread-spectrum waveform as claimed by the Applicant.

Claim Rejections Under 35 U.S.C. §103:

Claims 4, 9, 14, and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,570,864 to Kim et al. in view of U.S. Patent No. 6,282,233 to Yoshida.

Yoshida relates to a CDMA multi-user receiving apparatus for performing an interference canceling process in parallel for individual users. However, because claims 4 and 9 depend from allowable claim 1, claim 14 depends from allowable claim 11, and claim 28 depends from allowable claim 22, these rejections are moot and the claims should be allowed to issue.

Conclusion

In view of the above, the Applicants respectfully submit that the claimed invention is patentable. The Applicants therefore kindly request consideration of all claims in light of the above remarks and allowance thereof.

The Applicants hereby petition for any extension of time which is required to maintain the pendency of this case. If there is a fee occasioned by this response, including an extension

fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 141449.

The Examiner is also kindly requested to contact the undersigned if such would expedite examination and allowance of the application.

Respectfully submitted,
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